

15¢

April 5, 1952

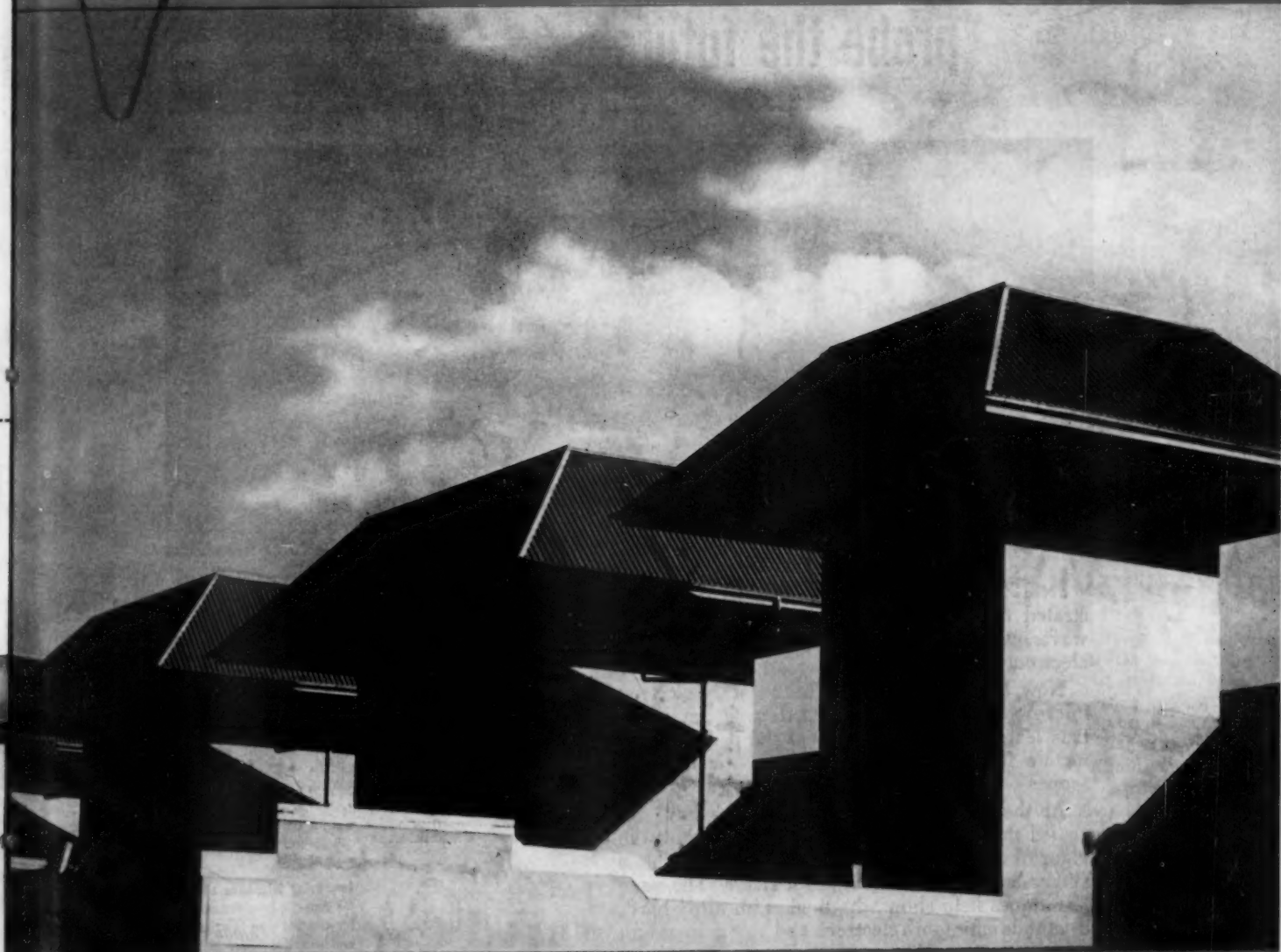
PUBLIC LIBRARY

APR 8 - 1952

DETROIT

SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE



Muffling Jet Sounds

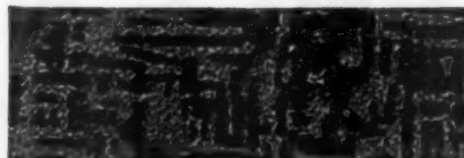
See Page 218

A SCIENCE SERVICE PUBLICATION

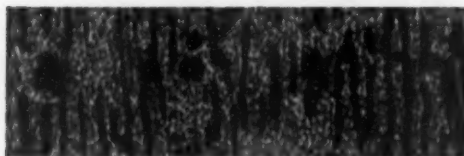
\$5.50 A YEAR

VOL. 61 NO. 14 PAGES 209-224

Electrons probe the future



1 Electron micrograph of an alloy of aluminum, nickel, cobalt and iron. Magnification 20,000 diameters.



2 Cooled from high temperature in a magnetic field, the alloy becomes a powerful permanent magnet. Note changed structure. Black bars reveal formation of precipitate parallel to the applied field. Each bar is a permanent magnet.



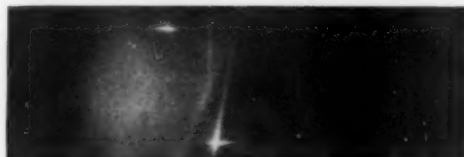
IN 1927, Bell Laboratories physicists demonstrated that moving electrons behave like light waves, and thus launched the new science of electron optics.

Now, through the electron beams of the electron microscope and electron diffraction camera, scientists learn crucial details about the properties of metals far beyond the reach of optical microscopes or chemical analysis.

At the Laboratories, electron beams have revealed the minute formations which produce the vigor of the permanent magnets used in telephone ringers and magnetron tubes for radar. The same techniques help show what makes an alloy hard, a cathode emit more electrons and how germanium must be processed to make good transistors.

This is the kind of research which digs deep *inside* materials to discover how they can be made better for your telephone . . . and for defense.

3 A Bell scientist adjusts electron diffraction camera. Electrons are projected on the specimen at glancing angles. They rebound in patterns which tell the arrangement of the atoms . . . help show how telephone materials can be improved.



4 Diffraction pattern of polished germanium reveals minute impurities which would degrade the performance of a transistor.



**BELL
TELEPHONE
LABORATORIES**

Improving telephone service for America provides careers for creative men in scientific and technical fields.

MEDICINE

Successful Gland Grafts

Key to transplantation is use of glands from unborn animals or human fetuses before they have reached the fifth month so no antibodies are formed in blood.

► **SEX REJUVENATION** by transplants of sex glands may be possible after all. If this is attempted by future surgeons, it will be done by transplanting the sex glands from unborn apes, instead of from adult animals as was tried 30 years ago by the Russian physician, Serge Voronoff.

The key to success in gland transplants into humans is the use of glands from unborn animals or human fetuses at an early stage of development rather than from adults, Dr. Harry S. N. Greene of Yale University, New Haven, Conn., finds.

He has already made three such transplants. Two were of adrenal gland tissue and the third was thyroid gland tissue. One of the patients, a 35-year-old man with Addison's disease, was operated on a year ago, is now alive and working. The second patient got his adrenal gland transplant four months ago. The thyroid gland transplant was made only a few weeks ago.

Both these last two patients are still living but Dr. Greene says it is too early to tell what the results of the operation will be. In the first patient the five pieces of adrenal gland grafted into the man's abdomen

seem to be growing and producing hormones the man's own adrenal glands failed to make.

In all three cases the gland transplants were taken from human fetuses before they had reached the fifth month of life in the womb. Up to this time, Dr. Greene has discovered, tissues from fetuses do not call up antibodies in the body of an adult. After the fifth month antibodies do arise when fetal tissue is transplanted into an adult. The antibodies, similar to those the body mobilizes to fight disease germs and other foreign protein, keep the gland grafts from being successful.

The tissues from fetuses under five months are like malignant cancers in that the young fetal tissues and the cancers do not call up antibodies when transplanted into another body. Dr. Greene thinks this means there is some factor missing from the fetal tissue and the cancers. For cancer fighting, the hope is that this factor can be identified and from that knowledge better means of controlling cancer can be developed.

Science News Letter, April 5, 1952



PHOTO RECONNAISSANCE PLANE—The RF-84F high-speed, high or low altitude, day or night photo reconnaissance plane, carries four .50 caliber machine guns for armament. Although performance details are under security wraps, it flies very much faster than the Thunderjet.

● RADIO

Saturday, April 12, 1952, 3:15-3:30 p.m. EST

"Adventures in Science," with Watson Davis, director of Science Service, over Columbia Broadcasting System.

Dr. H. Jackson Davis, Director of Technical Cooperation in Uruguay for the Institute of Inter-American Affairs, U. S. Department of State, discusses "U. S. Technical Assistance in Uruguay."

TECHNOLOGY

Machines Will Make Clerks Obsolete

► **CLERKS WILL** be as obsolete in the future as galley slaves of old, Dean Louis N. Ridenour of the University of Illinois predicted to the Mutual Insurance 200th anniversary conference on the future in New York.

Electronic brains or information machines will bring about a second industrial revolution, he declared. Machines will be able to substitute for human beings in the performance of any routine occupation that can be fully specified. Except for acts of imagination and genius, machines will be able to do any mental task for the next generation better than human beings.

The only reasons that machines are not used more now are that they are costly and still somewhat primitive. For many jobs, people can still be hired for less than an adequate machine.

Dr. Ridenour warned labor unions that they are the machine's best friend since the cost of human labor is pricing people out of the labor market.

Science News Letter, April 5, 1952

PSYCHOLOGY

Discounting Opponent's Claims May Help Him

► **A POLITICAL** speaker who tries to discount what his opponent has said is using a two-edged weapon, it is indicated by an experiment reported in Atlantic City.

He may reduce the effectiveness of the opponent's arguments for the time being. But as time goes on his speech may actually serve to prevent the opponent's arguments from losing their effectiveness.

In an experiment reported by Walter Weiss of Yale University to the Eastern Psychological Association meeting, high school students were given a lesson on the effects of smoking. Later a group of the students were given a lecture intended to discount or make them skeptical of the original lesson. Opinions about smoking changed after the first lesson. After a few weeks, however, the opinion change was lessened. Those who listened to the discounting lecture had less change of opinion at first. But later on the original lesson's effectiveness had dropped less for those of the discounted group.

Science News Letter, April 5, 1952

METEOROLOGY

Escape Tornado Injury

► WHEN A tornado cloud appears, if you have time you should shut off the electricity and gas to your house immediately. Then you should retreat to the southwest corner of the basement if your house is frame. If you are in a building made of reinforced concrete or of steel, stand beside an inside partition on a lower floor.

✓ If you are outside, lie flat in a ditch or culvert and hold on to a fixed object so you won't blow away. Protect your head against flying objects. If you are in a city, don't jump in your car and try to get away from the tornado because high winds, often carrying debris and hail, might wreck the car and even kill the occupants.

Those words of advice come from Dr. Edward M. Brooks, tornado expert of St. Louis University, who estimated that the chance in any given year of a person's being killed by a twister is only one in 400,000. Dr. Brooks said most persons killed by tornadoes are struck in the head by flying debris or later are burned to death in fires following in the wake of the swirling air funnels.

Although tornadoes are more likely to occur in a general area extending from Louisiana and Texas up to Iowa and South Dakota, they have been recorded in unlikely spots east of the Appalachians. The tornado season is roughly from March to August and the storms occur in the more northern parts of the country as the season progresses.

Dr. H. Wexler of the U. S. Weather Bureau said meteorologists do not know exactly how tornadoes are formed. They seem to occur, though, when warm, moist air currents blowing inland from the Gulf of Mexico meet cold air masses moving eastward from the Pacific, he said.

Latest techniques in weather prediction make it possible to estimate approximately where the two air masses will meet, but

actually pinpointing the spots at which tornadoes will occur is not yet possible.

Dr. Brooks said persons should learn to recognize local tornado signs and to watch the skies when forecasts call for severe local storms.

Tornado clouds often are very dark because of their thickness. They may have a greenish or a yellowish tint. Often they appear to have great lumps hanging ominously toward the earth like large drops of water clinging to a ceiling.

Violent thunderstorms often precede tornadoes. A roaring or buzzing sound is created when the tornado funnel sweeps across the ground. The noise has been heard up to 25 miles away and for as long as one hour before the tornado struck the observer's area. The noise occurs to a lesser extent even when the funnel is aloft. It often is accompanied by long, overlapping rolls of thunder which create a continuous background rumble, Dr. Brooks added.

Science News Letter, April 5, 1952

PSYCHOLOGY

Plastic Eyecaps Test Color Theories

► SIXTY MEDICAL students and doctors wore plastic eyecaps which seemed to envelop them in a red, blue, green or yellow fog in an experiment to throw new light on how you see colors. The results were described to the Eastern Psychological Association meeting in Atlantic City.

The formless diffused light under the caps was given color by shining light on them through a colored filter, for a period of ten minutes. Then the light was changed to a test color.

When the eye got used to the test color, the color completely disappeared—no color

was seen. If white light or darkness were used in the pre-test, it had no effect on the time of adaptation to the test color.

By contrast, if the color of the pre-test was the same as that of the test, the color vanished immediately.

The effects of pre-test color on adaptation time to a different color failed to fit in completely with any of the accepted theories of color vision, Julien E. Hochberg, of Cornell University, and William Triebel, of Grasslands Hospital, Valhalla, N. Y., told the meeting. The experiment was conducted at New York Hospital, New York.

Science News Letter, April 5, 1952

SCIENCE NEWS LETTER

VOL. 61

APRIL 5, 1952

No. 14

The Weekly Summary of Current Science, published every Saturday by SCIENCE SERVICE, Inc. 1719 N St., N. W., Washington 6, D. C., North 2255. Edited by WATSON DAVIS.

Subscription rates: 1 yr., \$5.50; 2 yrs. \$10.00; 3 yrs., \$14.50; single copy, 15 cents, more than six months old, 25 cents. No charge for foreign postage.

Change of address: Three weeks notice is required. When ordering a change please state exactly how magazine is now addressed. Your new address should include postal zone number if you have one.

Copyright, 1952, by Science Service, Inc. Reproduction of any portion of SCIENCE NEWS LETTER is strictly prohibited. Newspapers, magazines and other publications are invited to avail themselves of the numerous syndicate services issued by Science Service. Science Service also publishes CHEMISTRY (monthly) and THINGS of Science (monthly).

Printed in U. S. A. Entered as second class matter at the post office at Washington, D. C. under the act of March 3, 1879. Acceptance for mailing at the special rate of postage provided for by Sec. 34.40, P. L. and R., 1948 Edition, paragraph (d) (act of February 28, 1925; 39 U. S. Code 283), authorized February 28, 1950. Established in mimeograph form March 18, 1922. Title registered as trademark, U. S. and Canadian Patent Offices. Indexed in Readers' Guide to periodical literature, Abridged Guide, and the Engineering Index.

Member Audit Bureau of Circulation. Advertising Representatives: Howland and Howland, Inc., 393 7th Ave., N.Y.C., Pennsylvania 6-5566 and 360 N. Michigan Ave., Chicago. STAtE 2-4822.

SCIENCE SERVICE

The Institution for the Popularization of Science organized 1921 as a non-profit corporation.

Board of Trustees—Nominated by the American Association for the Advancement of Science: Edwin G. Conklin, Princeton University; Karl Lark-Horvitz, Purdue University; Kirtley F. Mather, Harvard University. Nominated by the National Academy of Science: Harlow Shapley, Harvard College Observatory; R. A. Millikan, California Institute of Technology; L. A. Maynard, Cornell University. Nominated by the National Research Council: Ross G. Harrison, Yale University; Alexander Wetmore, Secretary, Smithsonian Institution; Rene J. Dubos, Rockefeller Institute for Medical Research. Nominated by the Journalistic Profession: A. H. Kirchhofer, Buffalo Evening News; Neil H. Swanson, Baltimore Sun Papers; O. W. Riegel, Washington and Lee School of Journalism. Nominated by the E. W. Scripps Estate: Frank R. Ford, San Francisco News; John T. O'Rourke, Washington Daily News.

Officers—President: Harlow Shapley; Vice President and chairman of Executive Committee: Alexander Wetmore; Treasurer: O. W. Riegel; Secretary: Watson Davis.

Staff—Director: Watson Davis. Writers: Jane Stafford, A. C. Manahan, Marjorie Van de Water, Martha G. Morrow, Ann Ewing, Wadsworth Likely. Science Clubs of America: Joseph H. Kraus, Margaret E. Patterson. Photography: Fremont Davis. Sales and Advertising: Hallie Jenkins. Production: Priscilla Howe. In London: J. G. Feinberg.

Question Box

ACOUSTICS

What are the two main problems of jet plane manufacturers? p. 218.

BIOCHEMISTRY

In what way has mental illness been linked to copper in blood? p. 216.

CHEMISTRY

How is alcohol made from wood wastes? p. 213.

MARINE BIOLOGY

What is the biggest animal known? p. 219.

Photographs: Cover, General Electric Company; p. 211, Republic Aviation Corporation; p. 213, Jensen-Salsbery Laboratories, Inc.; p. 215, Roosevelt Hospital; p. 218, U. S. Air Force.

MEDICINE

What are the seven danger signs of possible cancer? p. 214.

METEOROLOGY

How is the size of raindrops now being measured in New Hampshire? p. 215.

PSYCHOLOGY

Can dice be willed to fall a certain way? p. 217.

VITAL STATISTICS

Why is secrecy on birth and death certificates a problem? p. 216.

CHEMISTRY

Origin of Solar System

Chemist, geologist, astronomer and physicist can reconstruct the process of earth's formation. Cheap grain alcohol can be made from wood waste.

► RECORDS OF the formation of our solar system have not been destroyed, Dr. Harrison Brown of the California Institute of Technology told the meeting of the American Chemical Society in Buffalo, when he received the Society's award in pure chemistry.

Explaining his chemical theories of the origin of our solar system, he said we have only to learn to read these records correctly. The chemist, the geologist, the astronomer and the physicist, working together, can successfully reconstruct the process.

Two groups of planets which differ dramatically in their weights and densities move around the sun. The atmospheres of these planets also differ. Carbon dioxide in the atmospheres of Venus, earth and Mars tells astronomers and chemists that carbon is highly oxidized on these inner planets.

In contrast, the sun's giant outer planets, Jupiter, Saturn, Uranus and Neptune, have methane in their atmospheres, and at least on Jupiter there is an appreciable quantity of ammonia. This means that carbon exists there in a highly reduced state. Opposite kinds of elements are believed to make up the bulk of these two kinds of planets, the heavier metals compose earth and the other dense, solid inner planets. Outer planets are so light that they must be made largely of gases with hydrogen and helium predominating.

What conditions, Dr. Brown asked in his address, would the chemist recognize as necessary to form such a series of planets, supposing our universe to start with the average composition of cosmic matter?

Three groups of elements and compounds could exist, according to Dr. Brown. Those easily condensable would contain metals, oxides and silicates, a small fraction of the whole. Such materials make up the inner planets. Elements and compounds of intermediate condensability include water, ammonia and methane. Jupiter must have been in the best position to take up the bulk of such material.

Left over are hydrogen and helium which would not condense at the temperature of space. These light elements were not so much lost from planetary atmospheres as not captured at the time of formation.

Air and water must, according to this theory, be of secondary origin, formed by reactions among the elements present after the formation of the planets similar to earth. These include not only the inner group but also Pluto, the farthest of the planets. Interpretation of the possible chemi-

cal reactions would allow scientists to read the conditions which must have been present to account for the chemical facts now evident in the solar system.

Alcohol From Wood Waste

► GRAIN ALCOHOL can be made from wood waste at less than one-half the price of production from black strap molasses, Dr. Nathan Gilbert of the Tennessee Valley Authority announced at the meeting.

In the process sawdust and chips are treated by continuous percolation with dilute sulfuric acid. This results in a material similar to molasses which can be used without concentration for cattle feed and for the production of grain alcohol.

Operating difficulties have been overcome, Dr. Gilbert said, and the new process is now in production.

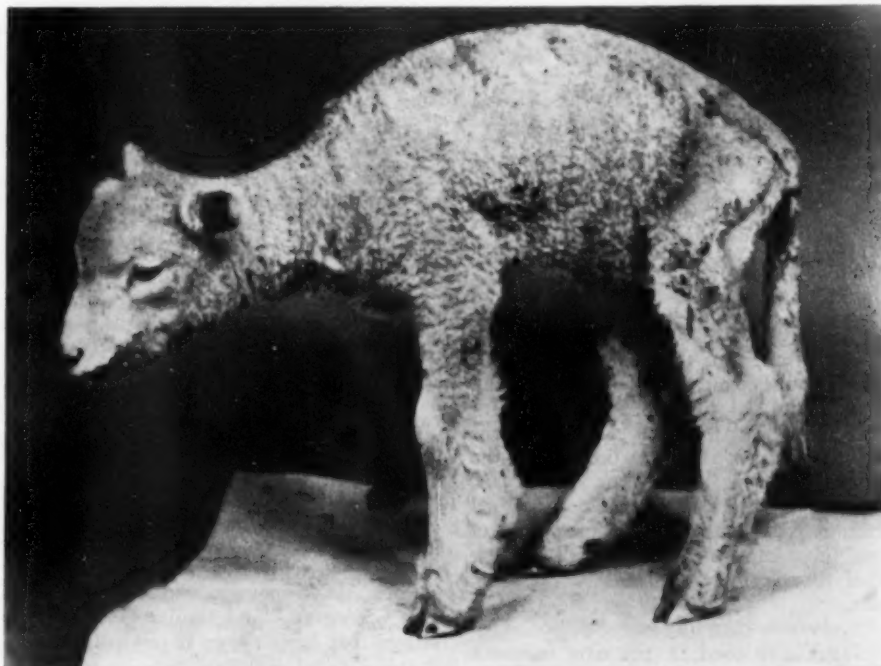
An end to danger from sweaters bursting into flame is promised in a report by

Prof. James M. Church of Columbia University, New York. New organic chemicals which contain phosphorus make fibers fireproof but avoid the trouble of losing the fireproofing material in the wash. Sweaters and other rough textured materials treated with the new fireproofing chemicals can now be worn and washed with assurance that, if a cigarette ash should set fire to the garment, the heat will transform the fireproofing compound clinging to the fibers into phosphoric acid which will efficiently smother both flames and afterglow.

Antibiotics such as penicillin are more efficient in promoting the growth of chicks than are either germicides or detergents having the same kind of effect in the chick's body.

This is found by Dr. Joel R. Stern, Joyce C. Gutierrez and Dr. James McGinnis of the State College of Washington. The scientists are investigating the belief held by some farmers that stimulation of growth by penicillin is the result of mechanical action in killing off harmful bacteria in the chicken's intestinal tract. Dr. Stern and his group reported that the effect of the antibiotic is greater than that produced by much larger quantities of chemicals not of antibiotic origin.

Plutonium, man-made atomic bomb element, builds itself into the bones when it is absorbed by the body, but does not replace the calcium of which the bone is made. The addition to knowledge about



FEWER SICK LAMBS—More lamb chops, veal and steaks may come from research by the American Veterinary Medical Association. Thousands of lambs and calves that would otherwise die this spring from "white muscle" disease may be saved by a new drug containing alpha tocopherol, most potent form of vitamin E. A sick lamb is shown here.

the action of this poisonous and radioactive element was reported by Walter E. Kisesleski and Austin M. Brues of Argonne National Laboratory, Chicago. Fifty-five percent of the plutonium injected is still retained by the body 265 days later, mostly in bone.

Make New Hydrocarbons

► NEW SOURCES of aviation fuel spur chemists to create hot-burning liquids economical to manufacture. R. M. Caves and R. L. McLaughlin of the Mellon Institute, Pittsburgh, and P. H. Wise of the National Advisory Committee for Aeronautics, Cleveland, reported to the meeting on their success in making a series of such compounds.

Linking together substances similar to carboxylic acid and hydrocarbons derived from propane, these chemists get a satisfactory amount of new hydrocarbon compounds in a series of three diphenyl alkylpropanes and the corresponding dicyclohexyl compounds.

Thirteen new organic compounds never before reported were described at the same meeting by George F. Lewenz of the Lewis Flight Propulsion Laboratory, National Advisory Committee for Aeronautics, Cleveland, and Kasper T. Serijan, Armour and Co., Chicago. An additional 22 new compounds of another series were prepared by this team, in a program to provide samples of known structure with which to compare chemicals to be identified in the future. The chemists described their methods of making these new additions to the aromatic series of organic compounds.

Warn of Smog Poisons

► DANGERS DUE to ordinary poisonous chemicals can now be detected by monitoring devices worn by workers exposed to them, just as atomic workers carry small instruments to detect radioactivity.

A new safety device for this purpose was described by Gordon D. Patterson, Jr., of Du Pont and Dr. Melvin G. Mellon of Purdue University, reporting their work on air pollution to the meeting.

Sulfur is the element blamed for smog and similar industrial fume problems. The indicator described by these chemicals turns yellow, green or blue according to the amount of sulfur compounds in the air. The colors appear in vanadate-silica gel which is packed into a glass tube. One of these tubes can be worn by each worker. Other tubes can be used to analyze stack gases.

An alternate detecting material, periodate-silica gel, also used in the new indicator tubes, changes from white to pink and then to red brown when there is sulfur dioxide in the air.

Science News Letter, April 5, 1952

More than 600 children a year, almost all under four years of age, lose their lives through accidental poisoning.

MEDICINE

Detection of Cancer

Catching enemy when invasion is still small and localized is important part of fight against cancer. Seven danger signals listed.

(Second of a series of five articles on what can be done about cancer)

By JANE STAFFORD

► DETECTING CANCER as early as possible is an important part of the fight against the disease. You can easily see why when you understand the nature of cancer. It is abnormal growth which invades and spreads not only into surrounding parts of the body but also to distant parts.

Obviously, the chance of victory, in this case cure, is better when the enemy is small and localized in just one place. It is important to remember, also, that this abnormal growth, invasion and spread can and often does go on at a very rapid pace.

Cancer detection is very much a two-way job. The patient cannot tell by himself that he has cancer. But the doctor cannot tell until the patient comes for examination. For the patient, man or woman, there are certain symptoms or signs that should be considered danger signals. These are:

1. Any sore that does not heal.
2. A lump or thickening in the breast or elsewhere.
3. Unusual bleeding or discharge.
4. Any change in a wart or mole.
5. Persistent indigestion or difficulty in swallowing.
6. Persistent hoarseness or cough.
7. Any change in normal bowel habits.

These signs do not mean that a person necessarily has cancer. But the person who has any one of them should see a doctor to find out what is wrong, whether cancer or some other condition, and have it corrected.

These seven danger signals, as they are called, are the most frequent first expression of the commonest kinds of cancer.

Many persons have been told that early cancer is painless, that they should not wait for pain to drive them to a doctor. The last half of this is true. The first half is not necessarily so. Even a very small cancer, if located close to certain nerve endings, may cause pain or at least some kind of sensation of something not quite right or comfortable. "Heaviness," "pricking," "tightness," "soreness," and similar kinds of sensations may be felt even if real pain is not. If this kind of sensation goes on for more than a few weeks and if it is localized enough so that a person can, literally, put a finger on the place, then it should be investigated carefully by the doctor.

Being alert to these various signs and sensations that may mean cancer are the lay person's part of the cancer-detecting job.

The doctor's part of the job starts with a careful history of how the patient feels, all his symptoms and the ailments he and his parents have had. Then comes examination and if the suspected cancer is inside the body where the doctor cannot see or feel it, X-ray examinations may be made.

If cancer is still suspected, the doctor will probably want to clinch the diagnosis by a biopsy examination. This means examination under the microscope of material from the suspected cancer. This may be done by cutting out a piece from the edge of the growth, including a piece of normal tissue for comparison. Cutting out the piece of tissue is done painlessly with the aid of an anesthetic. The shape and arrangement of the cells, their organization and nucleus tell the expert who looks at them under the microscope whether or not they are from cancer.

In recent years a new microscopic test for diagnosing cancer has been developed. It is known as the smear test, the Papanicolaou test, the Pap test and the Papanicolaou test, because a scientist named Papanicolaou developed it. This test is based on the fact that cancers shed cells as trees shed leaves. These cells get into the body fluids of certain organs. Isolated lung cancer cells can be detected in the sputum and cells of cancer that has attacked the uterus can be detected in material smeared on a slide that is gently swept over tissues at the opening from the uterus. Cancer cells also have been found in stomach juice from patients with stomach cancer.

Since in this test the scientist must make his diagnosis on the basis of only a few cells, great skill and experience are required. A method that uses electronics to speed examination of material in this test has recently been developed and should make the test more widely available.

Because cancer often develops silently with very few symptoms in its early stages, many patients still are lost who could be saved by earlier diagnosis and treatment. In these cases it is not always the patient's delay or the doctor's that brings treatment too late. To help prevent this tragic loss of life, men and women who reach the age of 40 and 35 respectively are urged by many cancer authorities to have yearly or twice-yearly examinations by their doctors. The hope is that these men and women, who have reached the age when cancer most often attacks, will have their cancers detected in early, symptomless stages.

A cancer detection test that could be given as easily as the sugar test for diabetes



CONVERGING BEAM THERAPY—This artist's conception shows how the unique 50-gram radium treatment would work. The beams from 25 two-gram capsules converge on the patient's right kidney. The radium is so placed that the whole radiation amount is focused on the tumor site.

MEDICINE

Beams From 50 Grams of Radium Converge on Cancer

► A UNIQUE 50-gram radium treatment unit for cancer patients, one of two in the entire world, is going into operation at Roosevelt Hospital in New York.

The unit works on a new principle called converging-beam radium therapy. The 50 grams of radium are divided into 25 two-gram capsules of radium in the form of an insoluble sulfate salt. The 25 beams converge to give the patient increased effective radiation in deep-seated cancers with a minimum of skin damage as the gamma rays of the radium pass through the patient's body.

The structure for the unit was designed by Dr. Gioacchino Failla, physicist of Columbia University College of Physicians and Surgeons. Dr. Douglas Quick is director of the Roosevelt Hospital's new underground Henry Harrington Janeway Clinic where patients will be treated with the new unit.

The world's only other 50-gram radium unit is in the Institute of Cancer in Louvain, Belgium. The radium for the American unit has been loaned to Roosevelt Hospital by the Union Minière du Haut Katanga of Brussels.

Science News Letter, April 5, 1952

MEDICINE

Cancer Pain Attacked

► PAIN, GREAT fear of cancer victims, is being attacked along with efforts to find remedies for the various kinds of cancer.

Dr. Stanley Cobb, neuropathologist at the Massachusetts General Hospital, Boston, recently discussed the psychological aspects of cancer and what having cancer does to a patient's mental and emotional outlook.

Fear of pain from cancer sometimes even delays early diagnosis of the dread disease.

The medical profession now has a battery of methods for combating pain in the cancer victim. Drugs, nerve and brain operations, alcohol injections, hypnosis and psychology are used.

Newest drug is Dromoran, more powerful and longer acting than morphine. It is almost a synthetic morphine. It can cause drug-addiction, like morphine, and therefore is kept under control of the Federal narcotics act.

Another synthetic drug, hailed as the best of all back in 1948, is methadon. One advantage it has over the opiates is that it does not produce a false sense of well-being, or euphoria.

A wash of radioactive gold produces relief in certain kinds of cancer. When cancer spreads to the sac encasing the lungs, the sac becomes pimpled with many little new cancers. Enormous amounts of fluid form as a result. A wash of radioactive gold sloshing around between the lungs

and the sac kills many of these little cancers, thus reducing the amounts of fluid.

Metapon is still another of the pain-relieving drugs. Like morphine, patients develop a tolerance to it, so it must be used judiciously.

When fear is eliminated, the pain is less. Methods used to teach mothers not to fear childbirth are being tried on cancer patients with some success.

The operation known as lobotomy, where the surgeon cuts the nerve connections with the front part of the brain, sometimes relieves the patient of worries about his pain. He still feels the pain, but it doesn't bother him any more.

Injecting alcohol into the nerves which carry the pain sensations from the cancer areas to the brain has helped in some cases. Also cutting the same nerves has been tried.

Science News Letter, April 5, 1952

INVENTION

Combine Pajama and Crib Sheet for Child

► A CHILD'S pajama and crib sheet have been combined into one unit. The inventor is Bessie Jane Auer, Ossining, N. Y., and she received patent number 2,589,596. An object of the invention is to provide complete covering at all times, regardless of the position the child assumes.

Science News Letter, April 5, 1952

is greatly wanted. Many blood tests for this purpose have been developed. So far none has stood up as practical for mass screening of large numbers of people, the way chest X-ray pictures can be used to detect unsuspected tuberculosis by mass screening. But these chest X-ray screenings, started as part of the fight against tuberculosis, are actually helping to find unsuspected cancer, too. Of course in these cases it is cancer of the lung that is detected.

Science News Letter, April 5, 1952

Next Week: New Recruits Aid Old Guard to Halt Cancer.

METEOROLOGY

Find Raindrop Size On Mt. Washington Peak

► A DIFFERENT kind of poll is being taken in New Hampshire, this one with the help of a lady's nylon stocking, some oil and confectioners' sugar.

Meteorologists stationed atop Mount Washington, Gorham, N. H., are using this bizarre equipment to measure the size of raindrops. It is important to know raindrop and snowflake sizes to evaluate theoretically the strength of the echoes from radar returned by sheets of rain or snow.

The stockings are slightly oiled and then dusted with confectioners' sugar. When raindrops fall on this screen they cut neat holes in the oil-sugar mixture which consistently are 20% to 25% larger than the diameters of the raindrops making them.

Science News Letter, April 5, 1952

MEDICINE

Prostate Cancer May Be Twice As Prevalent

► **CANCER** OF the prostate gland may be much more common and strike men much earlier than was previously believed to be the case.

Dr. Perry Hudson, assistant professor of urology at Columbia University's College of Physicians and Surgeons in New York, made a survey of 104 inmates of a New York flophouse who had no symptoms of cancer obvious enough to take them to a doctor.

He found that 30% of these men, all over 45, had cancer of the prostate. He also discovered that the disease began in these men at ages ranging 10 years sooner than had previously been believed.

Before this survey it was generally believed that only 15% of men over 50 had prostate gland cancer.

Dr. Hudson said, however, that before these figures should be applied to the whole population, he would continue his investigation for a total of 1,000 cases.

The test for prostate cancer was made by taking a small sample of tissue from the part of the gland where 85% of the cancers occur. This was examined under the microscope. Dr. Hudson also discovered that two-thirds of these cases were tumors which had not spread beyond the prostate and thus were still in a position to be cured by surgery.

Science News Letter, April 5, 1952

PSYCHOLOGY

Upbringing Affects Success in Marriage

► **A LITTLE** girl dressing and undressing her doll or fondling her woolly dog is preparing herself for future motherhood if experiments conducted with rats apply also to humans.

Experiments indicating that the so called "maternal instinct" is not all inborn were performed by Dr. Bernard F. Riess, of the American Museum of Natural History and Hunter College, New York City, and were reported to a meeting of the Eastern Psychological Association in Atlantic City.

White female rats were brought up from the time they were weaned to maturity in cages from which everything they could play with or manipulate had been systematically removed. They were not even permitted to touch food pellets, nesting material or other animals.

When the animals became adult and had young, they did not nurse a single pup. Nest building was almost completely absent and other types of normal maternal behavior were greatly reduced. Maternal behavior cannot be considered entirely instinctive or due to changes in body chemistry, Dr. Riess concludes. The manner of upbringing has a lot to do with it, his study shows.

The way the male is brought up also determines whether he will make a good mate or will remain an "old bachelor," the meeting learned from Dr. Frank A. Beach and J. Kagan of Yale University.

When young white rats were allowed to mingle with female rats of the same age at a time when immaturity made complete mating impossible, the habit of treating the female only as a companion persisted in adulthood. These males were less likely to mate as adults.

Science News Letter, April 5, 1952

INVENTION

Gas Turbine Motor Drives Plane Propeller

► **TWO OR** more gas turbines may be used to drive a single propeller, according to a new invention by Frank M. Owner, Stanley W. Mansell and Francis C. I. Marchant, Bristol, England. The patent is numbered 2,589,853, and was assigned to the Bristol Aeroplane Company, Ltd.

Science News Letter, April 5, 1952

PSYCHOLOGY

Value of Mental Tests In Spotting Mentally Ill

► **WHETHER** MENTAL tests can serve to spot those individuals suffering from mental disorders was contested at the meeting of the Eastern Psychological Association in Atlantic City.

Success of the tests at Hillside Hospital, Glen Oaks, N. Y., was reported by Dr. Milton S. Gurrvitz. He studied 100 successive cases diagnosed as schizophrenics solely on the basis of psychological tests. Fifty of these were tested by the person who made the diagnosis, but the other 50 were tested by internes and were not even seen by the diagnostician. In 96 of the 100 cases, the clinical diagnosis by the physician was found to agree with that made by the tests although there was some disagreement about the type of schizophrenia in ten of these cases.

The psychotic person cannot always be distinguished from the normal individual on the basis of even an elaborate battery of mental tests, was the conclusion of two other psychologists.

They compared the test results of two individuals both above average in intelligence and both alike in age, sex and veteran status, but one normal, making good social and personal adjustment, and the other hospitalized as a schizophrenic.

The test scores were studied by two clinicians who had never seen the persons studied and also a seminar of 12 clinicians skilled with the tests. They were unable to say which person should be in the hospital, Dr. Roy M. Hamlin and Richard L. Newton of Western Psychiatric Institute and Clinic, Pittsburgh, Pa., told the meeting.

Science News Letter, April 5, 1952

IN SCIENCE

BIOCHEMISTRY

Mental Illness Linked To Copper in Blood

► **A NEW** approach to some mental diseases seemed indicated by findings of a man who is able to measure the minute amounts of metals and other elements found in the human body.

In a study of 40 cases of manic depressive and schizophrenic patients, Dr. Bert L. Vallee of the Massachusetts Institute of Technology, Cambridge, Mass., found almost double the amount of copper in the blood of most of the mentally ill patients.

Dr. Vallee urged caution in reporting his findings. They indicate, he pointed out, that mental illness has a basis in changes in man's physical system. Most psychiatrists, he contended, believe that mental illness is not a physiological process.

There is, normally or otherwise, Dr. Vallee said, only a minute amount of copper in a person's body.

Dr. Vallee also discovered that in persons who have leukemia, sometimes called cancer of the blood, the white blood cells contain only about ten percent of the normal amount of zinc.

Science News Letter, April 5, 1952

VITAL STATISTICS

Secrecy on Birth and Death Certificates Health Problem

► **THE CASE** for and against disclosing information on birth and death certificates was discussed recently by health officers, newspapermen, lawyers and social workers.

Arguments against disclosing such information are: Embarrassment, if not damage, in the case of illegitimate birth or adoption; the danger of false information being filed to avoid such embarrassment.

This last danger is important from the standpoint of health protection of the entire population. Statistics on the number of deaths from various diseases and on complications at birth must be accurate so that medical and public health scientists will know the strength of the disease enemies they are fighting.

But full information may be needed for just settlement of insurance claims and acceptance of certificates as evidence of citizenship. The citizen needing information from his birth record, moreover, should be able to get it with a minimum of delay and red tape, it was pointed out at the forum held under the auspices of the American Association of Registration Executives in Washington.

Science News Letter, April 5, 1952

SCIENCE FIELDS

PSYCHOLOGY

Phone Delivers Messages Faster Than Operator Relays

► THE EFFICIENCY of the telephone, radio and other modern communication systems far exceeds that of the human operator.

Figures showing how the operator acts as a bottleneck to hold up the flow of information were presented to the meeting of the Eastern Psychological Association in Atlantic City by Dr. J. C. R. Licklider of the Massachusetts Institute of Technology.

Even a poor telephone circuit can transmit about 20,000 bits per second, a "bit" being the mathematical unit of information. The human mind cannot begin to take in and relay all of this information, Dr. Licklider told the meeting.

He tested college students and graduates on the speed with which they could relay information of various kinds—digits, letters, nonsense syllables, patterns of dots and spoken and written messages. They passed the information on verbally or by pointing.

The highest rate was less than 40 bits per second for all the different kinds of material received.

"It appears safe to conclude," Dr. Licklider said, "that, except possibly in the cases of eidetic imagery and absolute pitch, the human channel-capacity is less than 100 bits per second."

The capacity of a television channel is higher than 10,000,000 bits per second.

"As an information relay, the human operator is indeed a bottleneck," Dr. Licklider concluded.

Science News Letter, April 5, 1952

ORNITHOLOGY

Need Experience in Seeing For Visual Discrimination

► IN ORDER to tell a circle from a triangle, you have to first learn how to see.

This is demonstrated by an experiment in which ring doves spent their first weeks with their heads inside a plastic hood. The head covering admitted diffused light but prevented the birds from perceiving the form of any object.

The hood was put on the birds before they opened their eyes (at three or four days old). When they were ten weeks old a hole was cut in the hood so that the birds could see with one or with both eyes.

Then the birds were trained to distinguish a circle from a triangle and jump to one form and not the other.

It took the birds brought up in a hood "significantly" longer to learn this trick

than it did pigeons reared in a normal manner. The covering produced a slight cloudiness in the fluid of the birds' eyes and reduced their visual acuity a little but these effects were not significant and did not cause the slower learning, according to Arthur I. Siegel, of the American Museum of Natural History and Queens College, who reported the experiment to the Eastern Psychological Association meeting in Atlantic City.

Science News Letter, April 5, 1952

CHEMISTRY

Check Stocks of Explosive Chemicals

► COLLEGE, HIGH SCHOOL and industrial laboratories will be checking their stocks of potassium and sodium chlorate, potentially explosive chemicals, as the result of an explosion of 400 pounds of chlorate at Howard University, Washington, D. C., that killed four janitors moving it after at least 16 years in storage.

Science News Letter, April 5, 1952

PSYCHOLOGY

Camera Shows You Can't Will Dice to Fall Your Way

► WHETHER OR not a person can "will" sixes to turn up on throws of dice depends on who tallies the throws.

The influence of the individual scorer's beliefs on the results of this much publicized experiment in ESP (Extra-Sensory Perception) was reported by Drs. R. S. Kaufman and F. D. Sheffield, of Yale University, to the Eastern Psychological Association meeting in Atlantic City.

The claim that the mind has power over dice was tested by a group of Yale students, part of whom believed in ESP while the rest were disbelievers.

The dice were thrown by a mechanical device which throws 96 dice at a time, the number reported to be most satisfactory by Prof. J. B. Rhine, Duke University "father" of ESP.

The ESP followers and the disbelievers made independent counts of the way the dice fell. The count of each person supported his own beliefs—the believers obtained evidence of ESP influence over the dice, the disbelievers found significant evidence in the opposite direction.

Meantime the Yale investigators had a hidden camera and photographed each throw of the dice. The camera findings showed that both were wrong; there was no evidence that anyone can will the dice to land in a particular way. Neither will the attempt to do so cause them to land in any other way.

"The results of previous ESP experiments cannot be trusted if the method of observation does not involve a permanent record made by a machine," they conclude.

Science News Letter, April 5, 1952

MEDICINE

12-Million-Volt X-rays To Treat Cancer Patients

► A 12,000,000-VOLT electrostatic generator, three times more powerful than any other in operation, has been completed at the Massachusetts Institute of Technology, Cambridge, Mass. Designed primarily to bombard and probe into the secrets of the nuclei of atoms, it will also be used for treatment of some deep cancers and research into cancer.

Insofar as treatments are concerned, the new Van de Graaff generator supplements two 2,000,000-volt generators which already have been used on about 300 cancer patients. It is too early, Dr. Hugh F. Hare, chief radiologist of the Lahey Clinic, said, to evaluate the results although 157 seem to be well after about 20 months.

Each generator shoots twice the amount of X-rays as would be produced by the world's entire supply of radium into the cancer tumors. A rotating chair holds the patient. The tumor is at the central point. The rest of the patient's body tissues receive only small amounts of radiation.

Within six months to a year, one of these 2,000,000-volt machines may be used to give a victim of leukemia, cancer of the blood, radiation over the entire body. The patient is himself a doctor. It first has to be discovered, through experiments with dogs, whether the healthy parts of the body can take this radiation. Also, the patient has not yet quite made up his mind to undergo the treatment.

Science News Letter, April 5, 1952

PSYCHOLOGY

Shock Reduces Tendency To See Things in New Way

► TREATMENT WITH electro-shock therapy reduces the tendency of a person to see things in a fresh way, members of the Eastern Psychological Association learned at a meeting in Atlantic City.

A group of patients at Payne Whitney Clinic, New York City, were asked to look at drawings used by psychologists to test perception. The figures are ambiguous; that is, they may appear one way or another and normal individuals looking at them will find that they suddenly shift from one appearance to another and back again. The rate of shift was measured for the patients and also for a group of normal students.

Then some of the patients were given electro-shock therapy. The reversal rate for treated patients dropped. For normal individuals, the rate increased with practice. For the patients who were not given shock, the rate remained the same.

The experiment was reported by Dr. V. R. Fischelli, of Hunter College and F. V. Rockwell and Lenore Clarke of the Payne Whitney Clinic.

Science News Letter, April 5, 1952

ACOUSTICS

Our World Grows Noisier

Jet engines being tested, huge trucks rolling through city streets, steel works, street cars all add up to a noisy world that makes millions uncomfortable.

See Front Cover

By WADSWORTH LIKELY

► JET ENGINES, factory machinery, the roar of city traffic—the noise goes upward in a cacophonous crescendo—the theme song of our civilization.

It hurts our ears. It can deafen thousands. It has reached the point where thousands of dollars are being spent each year on anti-hearing aids—on ways to make our civilization pipe down a little, at least to a bearable level.

The noisiest noise in our factories is the sound of a jet engine with afterburner being tested. The noisiest noise in the open air is that of traffic on a city street.

Some noises there is no escaping. This is true of the jet engines. One of the surest ways of testing these engines is to listen to them. Many defects first show up in the changes in sound and the motor can be stopped before it is damaged.

The intensity of the sound of a jet engine, 50 feet away from its tail assembly, has been measured at 134 decibels, the loudest industrial noise today. Inspectors and other workmen have to go closer to the engine than 50 feet.

The plane manufacturer has two problems. First, he has to protect the men who must work close to the jet engines from bodily damage. Second he must protect the other workmen in his factory and the people who live or work near his plant from the roar of the jet engines.

He has two channels of attack. First, he can try to reduce the sound at its source. For instance, mufflers are built into the test cells and the tails of the jet engines fit into the mufflers.

Then he can try to keep as much of the original sound as possible from getting far away from its source. He builds thick walls, which confine it, and he covers the inside of those walls with material which will absorb the noise.

The massive concrete structures shown on the cover of this week's SCIENCE NEWS LETTER are test cell intakes for jet engines on test. Their design helps to reduce sound levels of engines being tested.

The jets are only the most recent and most fearsome examples of industrial noise. Factories which work with metals or electrical power transformers send out noises which cut down the efficiency of the men who have to work with them and annoy the neighbors.

The noise in our factories has been going steadily up as our civilization becomes more complex, and now the Korean crisis has sent it to a new high. Not too much is yet known about the physical effects of sound on the human body, but some sounds can cause permanent deafness in some people, if they are subjected to it long enough.

The noise of the water dripping out of the faucet, or a feather falling to earth, or a jet engine tuning up is basically the same thing. It is a pressure variation set up in air by a vibrating object. The air carries these pressure vibrations to the ear drum. The drum moves back and forth, very rapidly, in response to these pressure variations. We have learned to recognize the different speeds and intensities which various sounds set up and to interpret them in our brain.

We can best hear and understand the sound of the human voice when the intensity of the sound is between 40 and 90 decibels. When sound goes up to 120 decibels, we experience discomfort and an-

noyance. Above 140 the sensation becomes definitely painful.

Evidence about mechanical damage to the ear is scanty, but in two cases the ear was ruptured at about 160 decibels.

Sound can make you deaf without rupturing the ear. Here again the data are incomplete, but there is clinical evidence that permanent deafness does result when men are exposed daily to noise over a long period of time. Under those conditions, it is generally agreed, the maximum safe noise intensity is about 85 decibels—quite a bit under the intensity of a jet engine.

And relatively short exposures to intense sound can produce temporary deafness in a number of cases.

The problem of industrial noise has become serious enough so that scientists are working on methods of combating it. Physicians, psychologists, architects and physicists are all working on the problem, each from his own angle.

Reducing the transmission of sound is mainly obtained by providing sound barriers. With a non-porous wall, the weight of the wall is the determining factor and it has to be rather heavy and thick to provide adequate sound insulation.

However, the weight factor can be reduced by building the wall in several layers



SOUND-PROOF ROOM—Fiber-glass acoustical insulation is used in this room for testing the effects of noise on hearing. Siren produces sounds whose levels and intensities can be accurately measured.

that are attached to each other in as few places as possible. The fewer the attachments for supporting the inner layers, the less sound transmission there will be. With no connections, you can lose 45 decibels through the use of a one-half inch plaster-board double wall.

What about the noise inside these barriers? Sound absorption must be relied on. Already in almost every room the materials used for furnishing and the people themselves absorb some of the sound. Adding a sound-absorbing material to the ceiling may not reduce the number of decibels of sound much more.

However, a small reduction in decibels may seem like a much larger reduction in loudness to the ears of the people who have to work with the sound.

Acoustic materials can also be used for controlling the reverberations of sound in a room. This can be overdone, so that the room is said to sound "dead."

The National Bureau of Standards has been experimenting with what they call space-absorbers. These are geometrical forms such as spheres, cubes, cylinders and pyramids. They are hung from the ceiling at various points in space in the room.

It has been found that these are much more efficient than the same amount of material applied to a flat wall because that side of the material facing the wall is useless. They are useful where not enough sound absorption can be achieved on the wall surfaces.

A special adaptation of this principle is in jet engine test stands. Honeycomb structures made of sound absorbent walls or streamlined baffles placed in the exhaust stacks cut down the noise considerably.

Architects are now considering noise levels when they begin drawing their plans and deciding construction methods.

Science News Letter, April 5, 1952

**NEW . . . 1952
FOR MICROSCOPICAL STUDIES IN
MINERALOGY & PETROLOGY**

MINERALS—POWDERED (100 mesh)
Selected for microscopical study. Set of 60.

MINERALS & GLASSES—known refractive index.
Range of index: 1.34 to 2.4. Intervals of 0.01 index throughout most of range. Set of 60.

COMMUNUTED COMMON MINERALS
Mounted in Blasam.
One elementary set—25 slides.
Two advanced sets—25 slides each.

PETROGRAPHIC SPECIMENS
Type minerals and rocks for demonstration of optical characteristics. Set of 25.

Prepared under the supervision of
Roy M. Allen, Sc.D.
Write for leaflet RA-SNL

R. P. Cargille 1111 Liberty Street
New York 6, N. Y.

MARINE BIOLOGY

**NATURE
RAMBLINGS**



Whales

► WHEN WE get to talking about the biggest animals that ever lived, we are apt to forget that they are still living.

Dinosaurs are what our minds jump to or mammoths and mastodons; but the mammoths were pygmies compared with the dinosaurs that roamed the earth long before their time, and the dinosaurs would have to yield first place for size to the modern whales.

The humpback whale is credited with a length of 60 feet, the right whale with

70, a chalcot with 80, while the blue whale has been known to reach a length of 85 feet.

Such size, of course, would be impossible to a land-dwelling animal. Whales can make it because they are supported on all sides by water, which is somewhat more dense than their bodies, and therefore takes up much of the burden that would have to be borne by bone and muscle and skin in land animals.

Whales are excellent examples of what adaptation to an environment can do to animals. They are mammals, warm-blooded animals that presumably once lived on land. But having taken to the water and lived there for many generations they have developed streamlined, fish-shaped bodies so perfectly that earlier generations naively classified them as fish.

Thus it came to pass that popular imagination saw the "sea monster" or "great fish" of the story of Jonah in a whale, and has been wrangling about the size of the whale's gullet ever since. And even the great Milton attributed to the whale a "scaly rind" as though it were a fish.

Whaling today is such a science that many of the heretofore unknown intimate details of the life histories of whales are being uncovered. But for the ordinary person who may not often get a chance to see a whale, even one stuffed in a museum, many restaurants throughout the country are now serving whale steak.

Science News Letter, April 5, 1952

**THIRD NATIONAL SCIENCE FAIR IS
Coast-to-Coast!**

Enter your local finalists in this dynamic, instructive event.

Washington, D. C.

May 8-10

Highlights of the meeting:

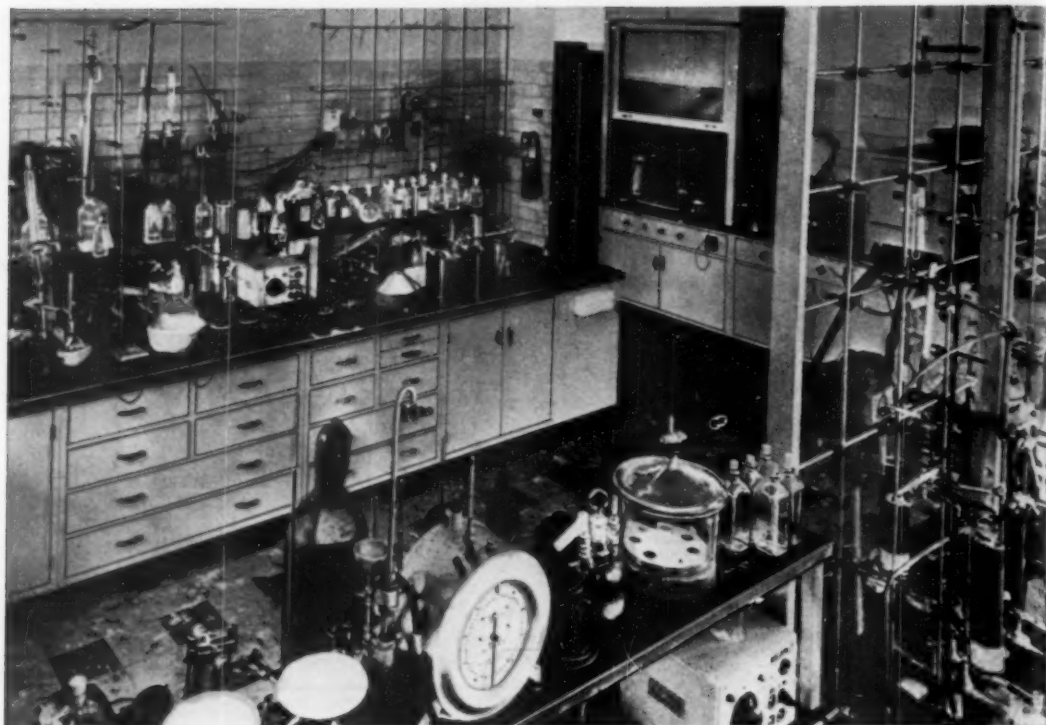
Contact with young scientists from Providence to Los Angeles
Meeting important scientists in research and industrial organizations
Awards of scientific equipment and material, totaling \$1,000, given twelve top entrants
Sight-seeing trips to points of scientific and historical interest
Solid silver and gold medals, engraved
Each school represented receives award certificate

Let us tell you how to enter your skilled boys and girls in this stimulating project

The NATIONAL SCIENCE FAIR
1719 N Street, N.W. Washington 6, D. C.

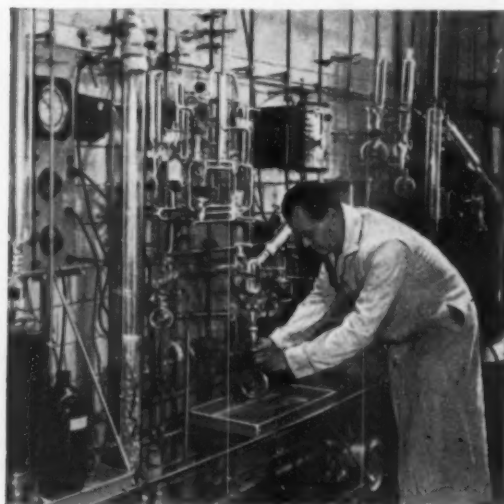


These Great Laboratory

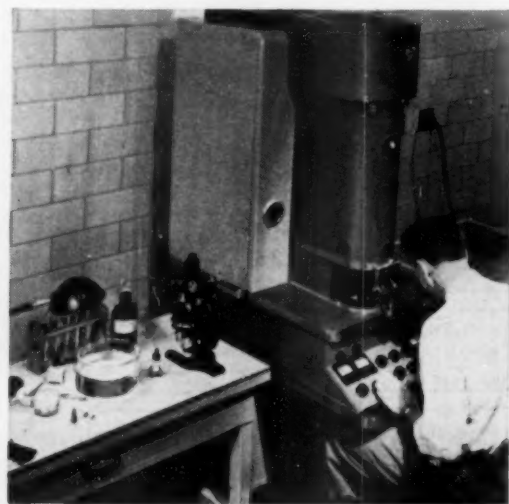


PETROCHEMICALS offer independent inventors great opportunity. Such synthetics as Nylon, Vinylite, Neolite are already indispensable to our expand-

ing economy—and new ideas in this area are at a premium today. If you have such an idea, the Sinclair Plan may help you develop it.



UNDER THE SINCLAIR PLAN, chemistry laboratories like these are now open to independent inventors.



ELECTRON MICROSCOPE, capable of magnifying 100,000 times, is typical of the equipment available.

ory Facilities Are Open to You

Many inventive people have responded to the Sinclair Plan's offer of laboratory facilities—to others who wish to do so, a suggestion: There is promise and profit in oil-based synthetics.

EIGHT months ago, Sinclair turned over a part of its great laboratories at Harvey, Illinois, to independent inventors who had promising ideas in the field of petroleum products but who did not have the facilities needed to develop or prove out their ideas.

To date nearly 5,000 people have submitted ideas to the laboratories, and the Plan is recognized as a valuable service to independent inventors. As a result we have made the Sinclair Plan part and parcel of the long-range operation of our company.

There may be inventive people interested in this Plan but wondering what sort of ideas or what areas would be profitable to explore. To those people we suggest the field of petrochemicals. Such things as plastics, synthetics and new materials made from petroleum offer great opportunities for invention and reward.

If you have an idea of this sort—or in the general area of petroleum products or applications—you are invited to submit it to the Sinclair Research Laboratories. In your own interest,

each idea must first be protected by a patent application or a patent.

The inventor's idea remains his own property

If the laboratories select your idea, they will make a very simple arrangement with you: In return for the laboratories' work, Sinclair will receive the privilege of using the idea for its own companies, free from royalties.

This agreement in no way hinders the inventor from selling his idea to any of the hundreds of other oil companies for whatever he can get. Sinclair has *no control* over the inventor's sale of his idea to others, and has *no participation* in any of the inventor's profits.

HOW TO PARTICIPATE: Instructions are contained in an Inventor's Booklet available on request. Write to: W. M. Flowers, Executive Vice-President, Sinclair Research Laboratories, Inc., 600 Fifth Avenue, New York 20, N. Y.

IMPORTANT: *Please do not send in any ideas until you have sent for and received the instructions.*



SINCLAIR RESEARCH LABORATORIES—nine buildings containing the most modern testing equipment known—have contributed many of today's most important

developments in petroleum. Under the Sinclair Plan, part of these laboratories is available to work on the promising ideas of independent inventors.

SINCLAIR—for Progress

Books of the Week

TO SERVE YOU: To get books, send us a check or money order to cover retail price. Address Book Dept., SCIENCE NEWS LETTER, 1719 N St., N. W., Washington 6, D. C. Ask for free publication direct from issuing organization.

ANNUAL REPORT OF THE FEDERAL SECURITY AGENCY—Office of Education—Govt. Printing Office, 42 p., paper, 20 cents. Describes the status of college students under Selective Service, Defense Training Programs, the National Scientific Register, and other concerns and activities of education for the year.

APPLIED RESEARCH IN THE UNITED STATES—Eugene W. Scott, Ed.—National Academy of Sciences, 90 p., paper, \$1.00. This report prepared for the Mutual Security Agency tells administrators of research in foreign countries how applied research is organized, administered and financed in the United States.

FOOD GUIDE FOR OLDER FOLKS—Rosalind C. Lifquist, Mary Walsh Cashin and Emily C. Davis—Govt. Printing Office, USDA Home and Garden Bulletin No. 17, 16 p., illus., paper, 5 cents. How to plan the adequate nutrition of people over 60.

FOREST ENTOMOLOGY—Samuel Alexander Graham—McGraw-Hill, 3d ed., 351 p., illus., \$6.00. It is now possible to predict whether or not a particular stand is likely to suffer from

insect pests and whether or not an individual tree will survive for a five-year period.

GAMBLING IN AMERICA—Herbert L. Marx, Jr., Ed.—Wilson, 222 p., \$1.75. Articles by many authors selected from magazines and newspapers. Intended to point out the desirability of a more consistent national or community policy as to what should be tolerated.

A GENERIC REVISION OF THE FAMILY AGROMYZIDAE (DIPTERA) WITH A CATALOGUE OF NEW WORLD SPECIES—Kenneth E. Frick—University of California Press, 452 p., illus., paper, \$1.25.

GEOLOGIC STRUCTURE AND OROGENIC HISTORY OF VENEZUELA: Text to Accompany the Author's Geologic Tectonic Map of Venezuela—Walter H. Bucher—Geological Society of America, 113 p., illus., \$1.50. This text and map were prepared as a result of a cooperative effort by petroleum companies, individual geologists, and the Servicio Tecnico de Geologia y Minería.

HEATING, VENTILATING, AIR CONDITIONING GUIDE 1952: An Instrument of Service Prepared for the Profession—American Society of Heating and Ventilating Engineers, 30th ed., 1496 p., illus., \$7.50. Contains a tech-

nical data section of reference material and a manufacturers' catalogue section with indexes.

HOW TO SOLVE GENERAL CHEMISTRY PROBLEMS—C. H. Sorum—Prentice-Hall, 157 p., paper, \$1.85. It has been the author's experience that students succeed better in learning how to work problems when they have them, together with explanations, in a separate book.

IES LIGHTING HANDBOOK: The Standard Lighting Guide—Illuminating Engineering Society, 2d ed., 987 p., \$8.00. A reference book with a wealth of information for engineers, decorators, architects and others.

MODERN GARDENING: A Complete Guide to the Agricultural Uses of Modern Chemistry's Miracle Drugs—P. P. Pirone—Simon and Schuster, 371 p., \$3.50. Practical information and advice for the home gardener. The second part contains answers to 500 questions.

NARCOTIC ADDICTION: A Bibliography—New York Academy of Medicine Library—Welfare Council of New York City, 39 p., paper, 50 cents. Prepared as an aid to investigation of this unhappy situation. Covers pertinent books published from early years to the present.

OPPORTUNITIES FOR THE BLIND AND VISUALLY IMPAIRED—Mary E. Switzer, Director—Office of Vocational Rehabilitation, 23 p., illus., paper, free upon request to publisher, Washington 25, D. C. This booklet shows that 18,000 blind workers are now employed. Here is information on what the visually impaired person can hope for. It will probably later be published in Braille and talking book editions.

PERFORMANCE OF A GAS-FIRED FORCED-AIR HEATING SYSTEM IN RESEARCH RESIDENCE No. 1—Seichi Konzo and others—University of Illinois, 48 p., illus., paper, 60 cents. Showing the desirability of using low air-flow rates.

PROBLEMS IN PHYSICAL CHEMISTRY—Lars Gunnar Sillen, Paul W. Lange and Carl O. Gabrielson—Prentice-Hall, 370 p., \$7.35. To aid the student in becoming familiar with thermodynamic quantities by learning the relations between them and why they change with varying conditions.

PROGRESS IN ORGANIC CHEMISTRY: Volume 1—J. W. Cook, Ed.—Academic Press, 287 p., illus., \$7.80. Concise descriptions of recent developments in selected fields of the science. The eight chapters are contributed by nine authors.

ANOTHER LANGUAGE

Is a MUST For Modern Scientists

Listen and Learn
Easily, Quickly,
Accurately
With



LINGUAPHONE

World's-Standard Conversational Method

FRENCH GERMAN
SPANISH RUSSIAN CHINESE
—29 Languages available

Learn AT HOME... with effortless ease and real pleasure. You LISTEN—you hear men and women speak in their native tongue. In an amazingly short time YOU understand and SPEAK, with correct accent and the right swing. You read and write. It's amazingly easy! You can study alone at your leisure, or have family and friends join you in a delightful pastime that is a cultural necessity and invaluable asset for travel; business or professional careers.

World-Wide Educational Endorsement

Linguaphone courses were made astonishingly easy and practical by more than 150 expert linguists of international fame. Endorsed by educators, used by colleges, schools, U.N., Armed Services, Government Agencies and more than one million home-study students. FREE Book gives Fascinating Facts—Mail coupon today.

Approved for Veterans' Training

—SEND FOR FREE BOOK—
LINGUAPHONE INSTITUTE
3104 Radio City, New York 20, N. Y.
Send me your FREE Book.

I want to learn..... Language
for..... reason.
Name.....
Address.....
City..... Zone & State.....

EUROPE On A Shoestring

It probably costs much less than you think to see Europe. For one thing there are many low cost tours originating in Europe, the kind that economical Europeans buy for themselves. Some are as low as \$5 a day for hotels, meals, sightseeing, etc.

The book that describes these tours and many other ways to see Europe as nearly on a shoestring as possible is the 1952 edition of *Europe on a Shoestring*.

Here are facts galore on—

What to see from one end of Europe to the other, including England, France, Italy, Switzerland, Austria, Scandinavia, etc.

When it's cheaper to rent a car than take your own; how to buy and sell a car overseas.

How to get the most for your money when going via rail, bus, sightseeing coach, etc.

How to save on foreign exchange. This part of the book alone will pay for its cost many times over.

In short, it covers everything you want to know—from what to see to how to see it, with facts, facts, facts. There's a handy guide to "How to Say It in 7 European Languages" (that section alone is also worth the price of the book). Of course, it's specific about passports, visas, customs here and in Europe, clothing to take, etc.

"No traveler can afford to go to Europe without this book," writes a travel agent. "Your book saved me enough last year to bring home lots of gifts," writes a woman. The intelligent traveler's vade mecum to Europe," says the French Government travel office.

For two dollars, you get this money-saving book, plus 2 supplements on where to stay, eat, and shop in England and France—more help on seeing Europe comfortably and at low cost.

Tear out ad, print name and address on sheet of paper, and mail with \$2 to

HARIAN PUBLICATIONS

11 THIRD AVE., GREENLAWN (LONG ISLAND), NEW YORK

YOUR SKIN AND ITS CARE

By H. T. Behrman, M.D., and O. L. Levin, M.D.

Two dermatologists give you the up-to-date scientific facts. They tell you in detail exactly what to do to beautify and improve your skin, how to avoid or correct skin disorders, and how to deal with many skin problems as: Daily care of the face—allergies—cosmetics—pimples—blackheads—acne—whiteheads—cysts—boils—oily skin—dry skin—chapping—poison ivy—cold sores—bites—superfluous hair—ringworm—moles—birthmarks—scars—warts—tumors—skin cancer—excessive sweating—etc. "The type of book to which the physician can refer his patients."—*Journal of the American Medical Association*. "Accurate, unvarnished story of practical skin care."—*Connecticut State Medical Journal*.

Price 2.50. Incl. postage. 8-day-Money-Back-Guarantee
EMERSON BOOKS, Inc., Dept. 121-H,
251 West 19th Street, New York 11

THE RADIO AMATEUR'S HANDBOOK—*American Radio Relay League*, 29th ed., 549 p., illus., paper, \$3.00. A reference book for all in the field from beginning experimenter to advanced amateur, from serviceman to physicist.

THE REPTILES OF OHIO—Roger Conant—*American Midland Naturalist*, 2d ed., 284 p., illus., \$3.50. Revised to bring this study up to date.

RESEARCH CORPORATION 1951 ANNUAL REPORT—*Research Corporation*, 63 p., paper, free upon request to publisher, 405 Lexington Ave., New York 17, N. Y. Reporting how \$875,000 in grants in aid was distributed.

SCHOOL HOUSING FOR PHYSICALLY HANDICAPPED CHILDREN—Romaine P. Mackie—*Govt. Printing Office, Office of Education Bulletin* 1951, No. 17, 26 p., illus., paper, 15 cents. Housing for crippled children should be designed to give them a feeling of security—plenty of handrails, ramps, good lighting—no swinging doors, slippery floors, sharp corners.

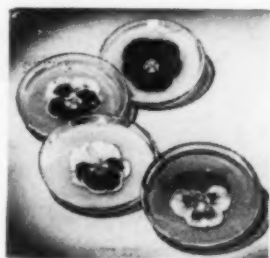
SOME APPLICATIONS OF ATOMIC ENERGY IN PLANT SCIENCE—Atomic Energy Commission—*Govt. Printing Office*, 211 p., illus., paper, 50 cents. Reports indicating the harmful effects of radiation on plant growth and also accounts of research with isotopes on plant physiology. This is the same as the eleventh semi-annual report of the U. S. Atomic Energy Commission.

STUDIES OF SLAB AND BEAM HIGHWAY BRIDGES: Part III, Small-Scale Tests of Shear Connectors and Composite T-Beams—Chester P. Siess, Ivan M. Viest, and Nathan M. Newmark—*University of Illinois*, 133 p., illus., paper, \$1.00.

THE WORLD BOOK ENCYCLOPEDIA 1952 ANNUAL SUPPLEMENT: Reviewing Important Events and Developments of 1951—J. Morris Jones, Mg. Ed., *Field Enterprises*, 182 p., illus., paper, \$1.25. Reviewing the events of 1952. Specialists in various fields contribute articles.

YOUR PROPERTY—PLAN ITS TRANSFER—J. H. Beuscher and Louise A. Young—*University of Wisconsin*, 16 p., illus., paper, 5 cents. Advice for farm owners on how to provide for disposition of the property in the event of death. Based on Wisconsin laws in effect on Sept. 1, 1951.

Science News Letter, April 5, 1952



PANSY COASTERS

Real Pansies
Are Embedded
in Castolite

and made into attractive coasters. The colorful beauty of the lovely flowers is preserved forever in Castolite, new magic liquid casting plastic.

Make Them Yourself—at Home

and save by ordering supply of Castolite and complete instructions or make them to sell to friends at big profit. Send 25c today for new Castolite Creations Manual and proved Home-Success Plan telling how to make or assemble costume jewelry pieces, smart buttons, unusual gift items. Have fun; make money. Write:

CASTOLITE CO., Dept. D-50, Woodstock, Ill.

MEDICINE

Bombard Boron in Brain

► SHOOTING SLOW neutrons from an atomic pile into the head of a patient with cancer of the brain who has had a boron isotope administered to him has shown results that "are sufficiently encouraging so that we are pursuing it with all the energy at our command."

This was the statement of Dr. William Sweet, neurosurgeon at the Massachusetts General Hospital and assistant professor of surgery at Harvard Medical School, Boston, based on his work with 58 brain cancer patients.

Dr. Sweet found that boron 10, an isotope of boron that is not radioactive, will go to brain tumors in three times the amount that it goes to normal brain tissues when it is injected into the blood stream. The possibility then exists, he explained, that if the boron in the head is "shot" with a stream of slow neutrons from an atomic pile, the atoms of boron will "explode" or disintegrate, destroying the brain tumor but not harming the normal part of the brain.

In actual practice so far, Dr. Sweet said, all 58 patients were first operated on to remove most of the brain tumor. The atomic pile was used in an effort to clean up any fragments of the tumor remaining in the

brain. The hope is that boron 10 alone eventually can be used to get rid of the entire tumor.

Dr. Sweet's 58 patients were sent to the Brookhaven National Laboratories of the Atomic Energy Commission, Long Island, N. Y. Here their heads were actually exposed to the stream of slow neutrons from the pile. Dr. Sweet was reluctant to be specific about the results in the 58 cases. He said the pile belonged to Brookhaven and therefore it was the prerogative of scientists there to announce the findings.

Dr. Sweet said that so far "there was no statistically significant clinical evidence" that this treatment is useful. However, he said that the proportion of boron 10 which goes to the brain tumor is "useful."

Science News Letter, April 5, 1952

Type specimens are to biology what the standard inch, pound, etc. are to measurement; they are the first representatives of a species of animal or plant to be described, and all future specimens are compared to them in seeking determinations of species.

The viper is the only poisonous reptile found in Britain.

Where Do You Want To Go?

France? Brazil? West Indies? Hawaii? Mexico?

Read what Christian Science Monitor says about a new way to travel that sometimes costs 1/3 to 1/2 less.

By the travel editor of The Christian Science Monitor: Many fascinating travel booklets pass over this desk in the course of a year but the one that arrived the other day so interested this department that it cost the office several hours of work in order that we might absorb its content. The booklet is entitled, "Travel Routes Around the World" and is the traveler's directory to passenger-carrying freighters and liners. In no time at all you find yourself far out to sea cruising along under tropical skies without a care in the world. You find yourself docking at strange ports and taking land tours to those places you long have read about. Most interesting of the vast listings of ships are the freighters which carry a limited number of passengers in quarters comparable to the luxury afforded in the so-called big cruise ships which devote most of their space for passengers.

LARGE ROOMS WITH BEDS

It is important to realize that in most cases today, freighter passengers are considered first-class passengers, although the rates charged are generally on a par with either cabin or tourist class fare. Most passenger-carrying freighters, to quote the booklet, have their private bath and shower, and these cabins offer beds, not bunks. The rooms are generally larger than equivalent accommodations aboard passenger ships, and the cabin of a modern freighter is sometimes even twice as large as first-class cabins on some of the older passenger ships.

This booklet points out that it is frequently astonishing how low freighter fares are as compared with passenger ship fares: for example, less than one-half of the passenger ship fare to California is the amount asked on freighters. On most of the longer runs, the difference in favor of the freighter is regularly from a third to half of the passenger ship fare.

SERVICE AND MEALS RATED EXCELLENT

Foreign ships offer their own specialties, says the booklet. Thus vessels in the East Indian trade serve Rikhtafel (or King's Table), the East Indian dish which can run to as many as 80 different courses. Scandinavian ships serve smorgasbord every day, and some of their desserts (like strawberries smothered in a huge bowl of whipped cream) are never forgotten. Another feature of freighter travel is in its informality. No formal clothes are needed. Sports clothes are enough.

Other valuable information such as how to tip, shipboard activities, and costs are covered in the booklet, "Travel Routes Around the World."

Some of the trips listed include a trip to England for \$160, a 12-day Caribbean cruise for \$240, or a leisurely three-month Mediterranean voyage for \$500.

The booklet is published by Harian Publications, Greenlawn, New York, and may be obtained by sending to the publisher.

So, when it arrives, all you need to do is sit down and take your choice. The booklet lists literally hundreds of ocean trips.

\$1 sends you this up-to-date guide complete with photos, maps, a thumb-nail directory to the ports of the world, bargain price overseas cruises, etc.—plus, without any extra cost to you!

LANDS IN THE SUN. Where to stay a while—even retire—in the West Indies, Mexico, Guatemala, and other lands to the south where the dollar buys so much more.

To get your copies, simply fill in coupon below and mail today with \$1 bill to Harian Publications, 9 Third Avenue, Greenlawn, New York.

TO HARIAN PUBLICATIONS,

9 Third Avenue, Greenlawn, New York.

I have enclosed a \$1 bill. Please send me TRAVEL ROUTES AROUND THE WORLD AND LANDS IN THE SUN. You will refund my money if I am not satisfied.

PRINT NAME

STREET ADDRESS

CITY STATE

☐ Check here if you want special \$2 offer, which includes the two books listed above plus THE SEAFARER'S TRAVEL FOR LESS KIT. This kit includes three publications which tell you all about choosing a cabin, which radio to take, etc. It answers the hundreds of questions which every traveler wants to ask about ships and the sea. Travelers say it helps double their fun and saves them money. Just check the box and mail two \$1 bills.

• New Machines and Gadgets •

For addresses where you can get more information on the new things described here, send a three-cent stamp to SCIENCE NEWS LETTER, 1719 N ST., Washington 6, D. C. and ask for Gadget Bulletin 616. To receive this Gadget Bulletin without special request each week, remit \$1.50 for one year's subscription.

✿ **PLASTIC AUTO** body resists denting, rusting, weighs about 185 pounds and is about two-tenths of an inch thick. The body may crack under heavy impacts, but usual fender-denting blows have no ill effects. The body springs back to original form, and holds paint well.

Science News Letter, April 5, 1952

✿ **"SKYHOOK"** FOR kite fliers is a trigger device which is attached to a kite string a short way down from the kite. At a certain height, it will release model gliders, helicopters, small make-believe bombs carried aloft by the kite. It also will trigger a box camera, enabling kite fliers to take aerial photos.

Science News Letter, April 5, 1952

✿ **PLANT FOOD**, for indoor and outdoor use, is completely soluble in water, and is odorless and stainless. Nitrogen, phosphorus and potassium in high concentration plus traces of boron, copper, manganese, sulfur and zinc provide a scientific diet for flowers, vegetables, shrubs, trees and lawns.

Science News Letter, April 5, 1952

✿ **SYNTHETIC THREAD**, said to have all-purpose uses on all types of fabrics, has been found especially good for materials containing synthetic fibers. Will work as well on a machine as in hand sewing. Cuts clean without fuzziness, does not snarl, dries quickly.

Science News Letter, April 5, 1952

Do You Know?

Tropical typhoons are given girls' names in alphabetical order.

Australian aborigines wear shoes made entirely of bird feathers to hide their footprints from enemies.

The value of π , the relationship of the diameter to the circumference of a circle, has been calculated to 2040 decimal places through 70 hours work on an electronic computing machine.

An electric counter can accurately measure 37 billion atomic disintegrations a second.

An *espaliered* tree is one which has been trained to grow in only two dimensions, and has a formal shape and a given number of branches.



✿ **CARRY-ALL PAIL**, insulated by a plastic cover having a zippered-on top, will keep iced drinks cold about 15 hours. Roomy and lightweight, it is shown in the photograph. The pail holds at least a dozen 12-ounce bottles and is protected from hot

weather by glass fibers electronically sealed inside the cover.

Science News Letter, April 5, 1952

✿ **PUMP**, BASED on a vibration principle, uses a curved axle which rotates within a flexible tube. A vane on the end of the axle pushes liquid through exit hole of the pump chamber. The pump has no packing and can handle crystals, sand or dirt in liquids.

Science News Letter, April 5, 1952

✿ **DOOR LOCK** uses a knob which rotates freely when the lock is thrown. When unlocked, the knob works like any other door-knob. Installation of this lock eliminates drilling and cutting doors. It is said by the manufacturer to be tamper-proof.

Science News Letter, April 5, 1952

✿ **LAMINATED WOOD** paneling, newly developed, has a unique finish made from wood chips. Its surface is attractive without further staining, varnishing or painting. The new plywood is exceptionally stable with respect to shrinkage and expansion, and is practically warp-free.

Science News Letter, April 5, 1952

GADGET BULLETIN

AMERICA'S PREMIER LISTING OF
NEW MACHINES AND GADGETS

The GADGET BULLETIN is a post card with names and addresses of manufacturers and inventors of the products described on this page every week.

Issued weekly to correspond with this Science News Letter column, each GADGET BULLETIN has a number to correspond with the number listed at the top of the column.

If you wish this Bulletin sent to you every week so that you can get information quickly on New Machines and Gadgets, send us \$1.50 for a one year subscription (52 cards for quick reference and easy filing).

I enclose \$1.50 for which please send me the weekly GADGET BULLETIN for one year. My address is imprinted at the right.

OK _____

SCIENCE SERVICE
1719 N Street N. W. • Washington 6, D. C.

Clip and enclose this address imprint whenever you write us to renew your SCIENCE NEWS LETTER subscription, change address, order other materials, etc. It identifies you as one of the SNL family. Lower line date is expiration. Allow three weeks for address change.

DETROIT PUBL. LIBRARY
TECHNOLOGY DEPT
96 PUTNAM AVENUE
DETROIT 2 MICH
DEC 52 483-769